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(71) Applicant  
Clive Hollinshead  
20691 Lari Mark, Perris, California 92370,  
United States of America

(72) Inventor  
Clive Hollinshead

(74) Agent and/or Address for Service  
Forrester Ketley & Co  
Chamberlain House, Paradise Place, Birmingham,  
B3 3HP, United Kingdom

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A43B 5/06

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A3B B8A1

(56) Documents cited  
GB 0399935 A EP 0152033 A FR 2276792 A  
US 3013564 A

(58) Field of search  
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INT CL<sup>5</sup> A43B  
Online databases: WPI

(54) Shoe and shoe sole

(57) A running shoe has a sole with a slot (15) extending from the front of the sole towards a heel for a distance which corresponds to the length of the big toe of a user. The slot lies between a part of the sole which underlies the big toe and a further part of the sole which underlies the other toes of the user.

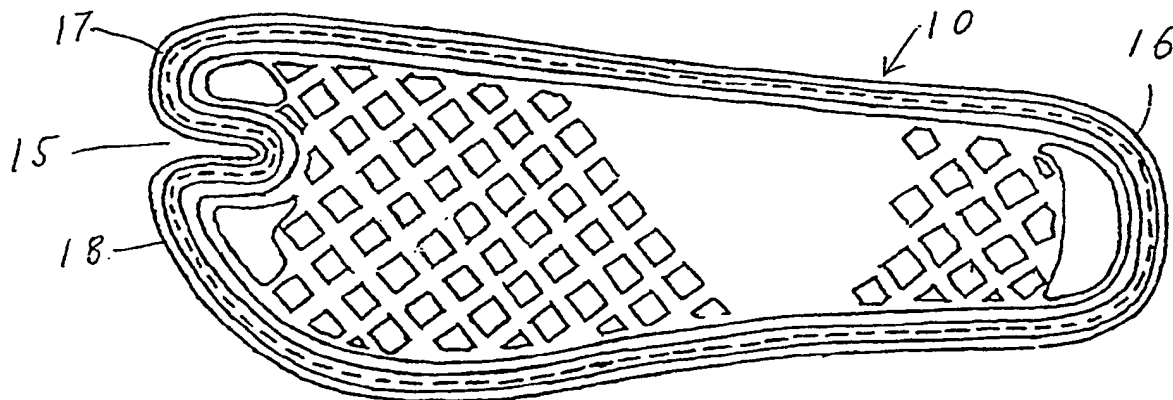


Fig. 2

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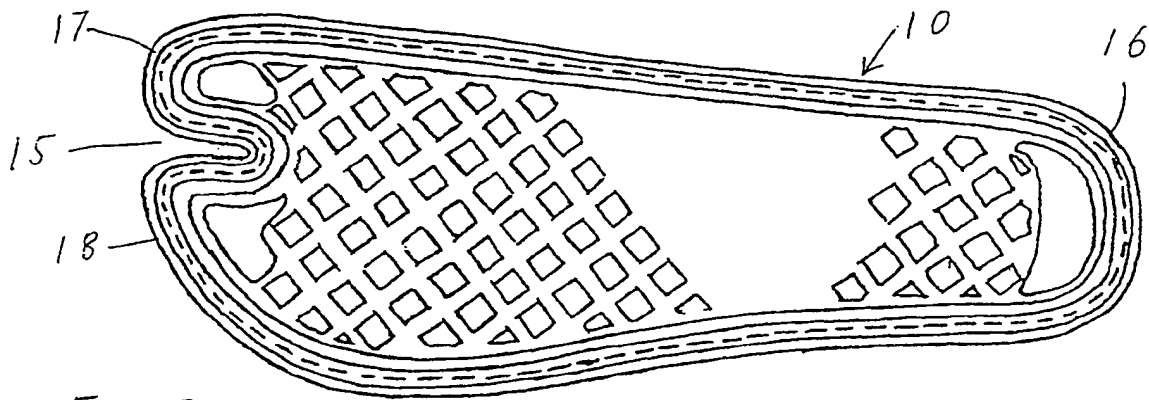
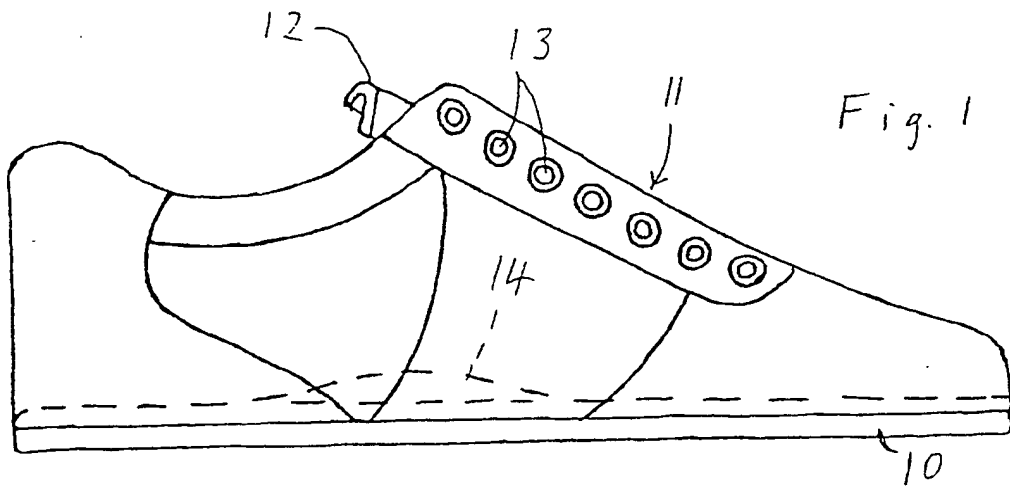


Fig. 2

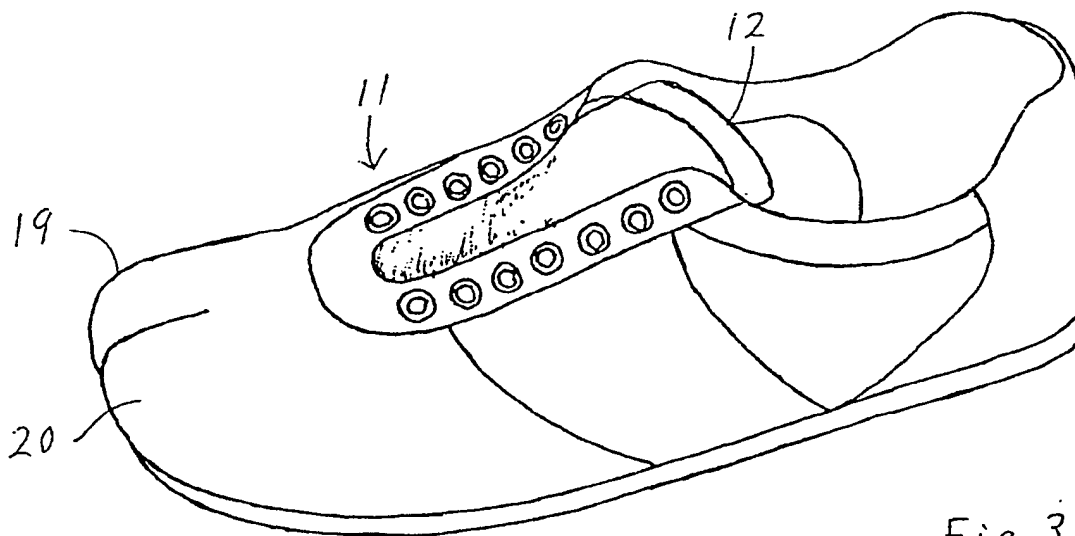


Fig. 3

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Fig. 4

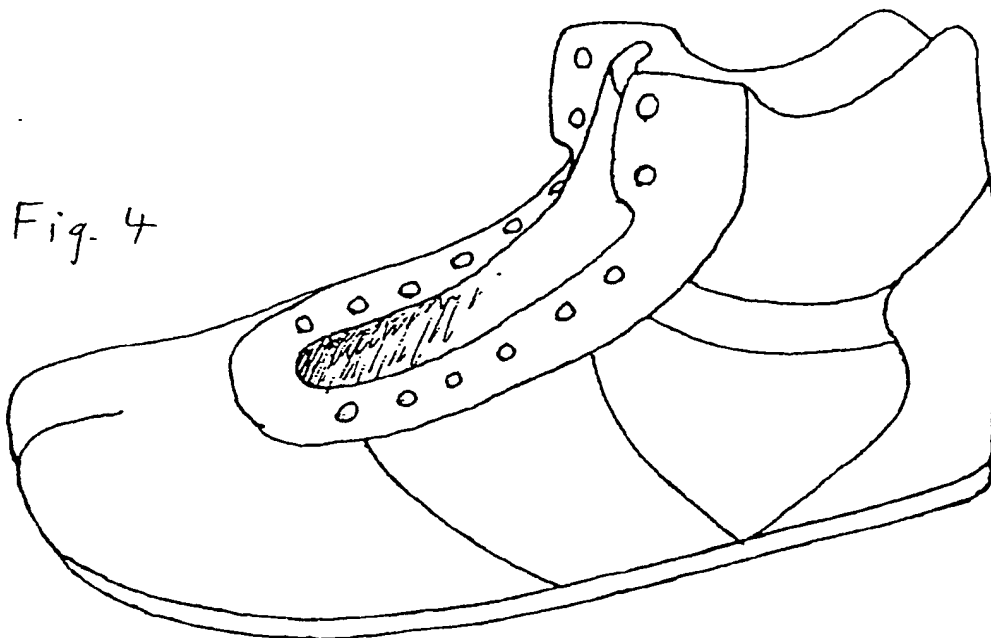
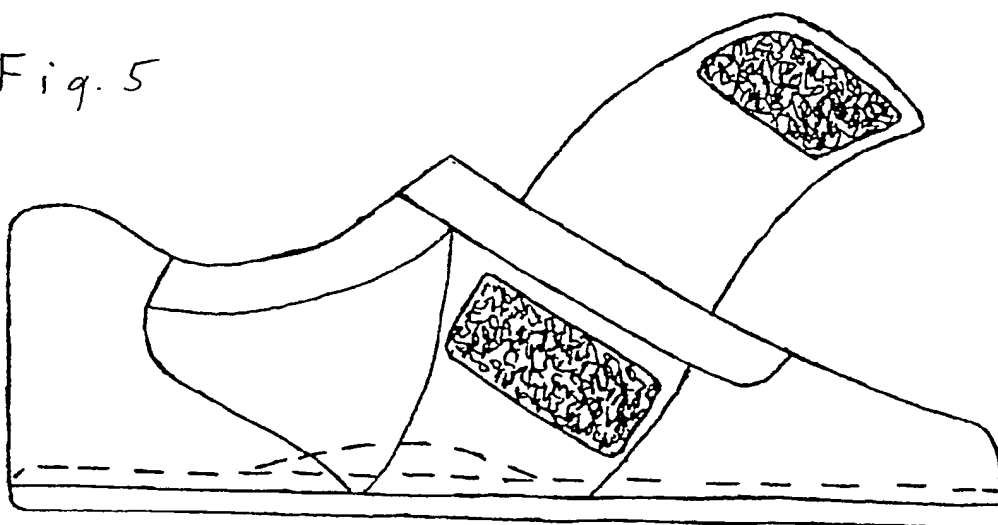


Fig. 5



Title: Shoe and shoe sole

**Description of Invention**

According to a first aspect of the present invention, there is provided a shoe comprising a flexible sole in which there is a slot extending into the sole from a front of the shoe.

According to a second aspect of the present invention, there is provided a sole for incorporation in a shoe, the sole having a front and a slot extending into the sole from the front.

The presence of the slot increases the independence of respective parts of the sole lying at opposite sides of the slot, as compared with the dependence of corresponding parts of a known sole in which there is no slot.

The slot preferably lies between a first part of the sole which, in use, underlies a big toe of a user, and a second part of the sole which, in use, underlies the other toes of the user.

The length of the slot is preferably within the range 10% to 45% and more preferably within the range 20% to 30% of the length of the sole.

The width of the slot at a position halfway along the slot is preferably at least 20% of the thickness of the sole adjacent to the slot and preferably no more than 60% of that thickness.

A shoe embodying the invention preferably further comprises an upper which include a first portion extending from the sole at one margin of the slot to the sole at an adjacent lateral margin of the sole and a second portion extending from the sole at an opposite margin of the slot to the sole at the other lateral margin of the sole. Immediately adjacent to the slot, these portions of the upper will be spaced apart. However, at a position spaced from the sole, the first and second portions of the upper may be in mutual contact along a part of the length of the slot.

Examples of shoes embodying the invention will now be described, with reference to the accompanying drawings, wherein:

**FIGURE 1** shows a side elevation of a first shoe,

FIGURE 2 shows a sole of the shoe of Figure 1 from the underside, FIGURE 3 shows a perspective view from above of the shoe of Figure 1,

FIGURE 4 shows a perspective view of a second shoe embodying a sole identical with that of the shoe of Figure 1 and

FIGURE 5 shows a side view of a third shoe embodying a sole identical with that of the shoe of Figure 1.

The shoe of Figure 1 comprises a sole 10 and an upper 11 which is secured to the sole around the periphery of the sole. The upper includes a tongue 12 and has holes 13 for receiving a lace.

The sole 10 includes an arch 14 arranged to lie beneath the instep of a foot occupying the shoe. Other parts of the sole 10 are substantially flat, when unstressed, and have a substantially uniform thickness. Alternatively, the sole may be moulded to have a thickness which varies from place to place.

There is in the sole 10 a slot 15 which extends from a front of the sole a part of the way along the length of the sole. The slot is substantially rectilinear and would, if produced, pass through a heel 16 incorporated in the sole 10. The length of the slot is within the range 10% to 45% of the length of the sole and is typically around 20% to 25% of the length of the sole.

The slot 15 extends through the thickness of the sole 10 and opposite margins of the slot are spaced apart in a direction from left to right. The opposite margins of the slot are mutually divergent in a direction towards the front of the sole. From a position approximately half-way along the slot to a position near to the closed end of the slot, the width of the slot may be substantially uniform. The width of this part of the slot is preferably no more than 60% of the thickness of the sole adjacent to the slot but is at least 20% of the thickness of the sole adjacent to the slot. The slot extends completely through the thickness of the sole from a top of the sole to a bottom of the sole. In the unstressed condition of the sole, opposite boundaries of the slot are preferably perpendicular to the bottom of the sole adjacent to the slot.

The sole 10 is flexible. A portion 17 of the sole which lies between the slot 15 and one lateral margin of the sole and which underlies the big toe of

a user can flex independently of a portion 18 of the sole at the opposite side of the slot 15.

The upper 11 also is divided at a position corresponding to that of the slot 15. A first portion 19 of the upper, which is adjacent to the front of the shoe and overlies the portion 17 of the sole, extends from the sole at the slot 15 over the big toe of the user to the sole at a lateral margin of the sole. A second portion 20 of the upper extends from the sole at the slot 15 over the other toes of the user to the other lateral margin of the sole 10. At the sole, the portions 19 and 20 of the upper are spaced apart by a gap corresponding to the slot 15. At a position spaced upwardly from the sole, the portions 19 and 20 of the upper will typically bear against each other in sliding contact.

During use of the shoe, particularly for running, force is transmitted from the toes of the user to the ground by the sole 10. The reaction to this force propels the user forward. The force transmitted to the ground by the sole from the big toe of the user is considerably greater than the force transmitted to the ground by the sole from the other toes of the user. Under the action of this force, the portion 17 of the sole can move relative to the portion 18. In a case where the surface of the ground yields somewhat under the pressure transmitted by the sole, the portion 17 can cause a greater deformation of the ground than does the portion 18.

The presence of the slot 15 enables the pressure exerted on the ground to be concentrated beneath the big toe of the user to a greater degree than is the case with known shoes having no slot in the sole.

The length of the slot 15 is preferably equal to or approximately equal to the length of the big toe of the user. The width of the slot 15 is such as to ensure that the portions 17 and 18 of the sole do not interfere with each other during use. In a case where the sole is formed of a resiliently flexible material which can spread sideways under pressure, the width of the slot may need to be greater than in a case where the sole is formed of a relatively non-resilient materials which does not spread sideways significantly when under pressure. The materials used in construction of the shoe may be materials used in the construction of known shoes.

Figure 4 illustrates a modification of the shoe of Figure 1. The modified shoe of Figure 4 has an upper of different shape but a sole which is identical with that of the shoe of Figure 1. A further modification of the shoe of Figure 1 is illustrated in Figure 5. The shoe of Figure 5 has an upper which differs somewhat from that of the shoe of Figure 1 but has a sole which is identical with the sole of the shoe of Figure 1. The upper of the shoe of Figure 5 incorporates a strap for holding the shoe in a closed condition and does not have lace holes.

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

**CLAIMS:**

1. A shoe comprising a sole in which there is a slot extending into the sole from a front of the shoe.
2. A shoe according to Claim 1 wherein the length of the slot is within the range 10% to 45% of the length of the sole.
3. A shoe according to Claim 1 or Claim 2 wherein the sole includes a heel and the slot would, if produced, pass through the heel.
4. A shoe according to any preceding claim wherein opposite margins of the slot diverge from each other in a direction towards the front of the sole.
5. A shoe according to any preceding claim further comprising an upper which includes a first portion which extends from the sole at one margin of the slot to the sole at an adjacent lateral margin of the sole and a second portion extending from the sole at an opposite margin of the slot to the sole at the other lateral margin of the sole.
6. A sole in or for a shoe as defined in a preceding claim, the sole having a front and a slot extending into the sole from the front.
7. A shoe substantially as hereindescribed with reference to the accompanying drawings.
8. Any novel feature or novel combination of features disclosed herein or in the accompanying drawings.



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**Patents Act 1977**  
**Examiner's report to the Comptroller under**  
**Section 17 (The Search Report)**

Application number 9025554.8

**Relevant Technical fields**

(i) UK CI (Edition K ) A3B

(ii) Int CI (Edition 5 ) A43B

**Databases (see over)**

(i) UK Patent Office

(ii)

ONLINE DATABASE: WPI

Search Examiner

J GRAHAM

Date of Search

4.1.91

Documents considered relevant following a search in respect of claims

1-7

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 0,399,935 (GIFFORD) see figure 3	1-4,6
X	EP 0,152,033 (CORETTI) whole document	1-6
X	US 3,013,564 (LEVEY) see eg column 1 lines 70,71 and the figures	1-6
X	FR 2,276,792 (ANFRURS) whole document	1-6

SF2(p)

Category	Identity of document and relevant passages	Relevant to claim(s)

#### Categories of documents

**X:** Document indicating lack of novelty or of inventive step.

**Y:** Document indicating lack of inventive step if combined with one or more other documents of the same category.

**A:** Document indicating technological background and/or state of the art.

**P:** Document published on or after the declared priority date but before the filing date of the present application.

**E:** Patent document published on or after, but with priority date earlier than, the filing date of the present application.

**&:** Member of the same patent family, corresponding document.

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